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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,112	04/05/2001	Sung Dae Cho	AB-698-1D US	4932

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EXAMINER

ALCALA, JOSE H

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/827,112		CHO, SUNG DAE	
	Examiner		Art Unit	
	Jose H Alcala		2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2002 and 05 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 21-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 21-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/219,407.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. This application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. A statement reading: "This is a divisional of Application No. 09/219,407, filed on 12/23/98." should be entered following the title of the invention or as the first sentence of the specification. Also, the current status of all nonprovisional parent applications referenced should be included.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 30-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 is not clear, in the possibility that there are three connecting bars, how can they be disposed in the same axis. In addition, it is not clear what is meant by "a direction of movement of the reel-deployable printed circuit board".

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Haghiri-Tehrani (US Patent No.5,362,955).

Regarding Claim 1, Applicant's Admitted Prior Art teaches a reel-deployable printed circuit board (See Figure 6) comprising: an elongated, flexible base board having opposite edges (reference number 40), but fails to explicitly teach: a slit formed into it, the slit having an inner periphery defining a unit board within the flexible base board; and at least a connection bar connecting the unit board to the base board such that the unit board is pivotable on the connection bar relative to the base board. Furthermore, the limitation: "the unit board is pivotable on the connection bar relative to the base board", is an intended use limitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. See *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Haghiri-Tehrani teaches an elongated, flexible base board (Reference number 11) having a slit formed into it (See Figure 5), the slit having an inner periphery defining a unit board within the flexible base board (See Figure 5); and at least a connection bar

(Reference number 30) connecting the unit board to the base board such that the unit board is pivotable on the connection bar relative to the base board (See Figure 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Applicant's Admitted Prior Art and Haghiri-Tehrani in order to have a flexible base board having a slit formed into it, the slit having an inner periphery defining a unit board within the flexible base board; and at least a connection bar connecting the unit board to the base board. Thus creating a specific, small and easily detachable path for separating the unit board from the flexible base, preventing errors caused in the process of having to punch through the whole periphery of the unit board.

Regarding Claim 2, Applicant's Admitted Prior Art teaches a bonding pad (Reference number 31) on a top surface of the unit board; a contact (Reference number 33) on a bottom surface of the unit board; and a via hole (Reference number 32) through the unit board electrically connecting the bonding pad to the contact. See Figure 2.

Regarding Claim 3, Applicant's Admitted Prior Art fails to explicitly teach that the contact comprises a layer of copper plated with gold. It was well known in the art at the time the invention was made, to use gold to plate a copper contact in printed circuit board technology to improve electrical conductivity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the contact comprising a layer of copper plated with gold, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability

for the intended use as a matter of obvious design choice, and based on the excellent conducting properties of copper and gold. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 4, Applicant's Admitted Prior Art teaches a dam (Reference number 35) inside the inner periphery of the slit.

Regarding Claim 5, Applicant's Admitted Prior Art fails to explicitly teach the base board is made of a glass-epoxy material. It was well known in the art at the time the invention was made, to use a glass-epoxy material for the substrates of printed circuit boards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the base board of a glass-epoxy material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and based on the excellent flexibility properties of a glass-epoxy material. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 6, Applicant's Admitted Prior Art teaches that the base board includes a sprocket hole (Reference number 41) along at least one of the edges thereof.

Regarding Claim 7, Applicant's Admitted Prior Art teaches that the base board includes a position hole (Reference number 42) along one of the edges thereof.

Regarding Claim 8, Applicant's Admitted Prior Art teaches a semiconductor chip (Reference number 21) attached to an upper surface of the unit board, the chip having a connection pad (It is inherent that there is a pad used to connect the bonding wire to the chip) on an upper surface thereof; and a conductive wire (Reference number 23) having

opposite ends, each bonded to a respective one of the bonding pad on the unit board and the connection pad on the chip.

Regarding Claim 9, Applicant's Admitted Prior Art teaches an encapsulant (Reference number 24) formed on the top surface of the unit board and encapsulating a region including the chip, the conductive wire, the bonding pad, and the connection pad.

6. Claims 21-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Haghiri-Tehrani (US Patent No.5,362,955).

Regarding Claim 21, Applicant's Admitted Prior Art teaches an apparatus comprising: a flexible base board (reference number 40), and a plurality of unit boards disposed within the flexible base board (as seen in figure 5), but fails to explicitly teach: the plurality of unit boards connected to the flexible base board by at least one connection bar, wherein each unit board is pivotable on its respective connection bar(s).

Furthermore, the limitation: "each unit board is pivotable on its respective connection bar(s)", is an intended use limitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. See *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Haghiri-Tehrani teaches an elongated, flexible base board (Reference number 11), a unit board within the flexible base board (See Figure 5); and at least a connection bar (Reference number 30) connecting the unit board to the base board. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

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combine the teachings of Applicant's Admitted Prior Art and Haghiri-Tehrani in order to have a flexible base board; and a plurality of unit boards disposed within the flexible base board, the plurality of unit boards connected to the flexible base board by at least one connection bar, wherein each unit board is pivotable on its respective connection bar(s). Thus creating a specific, small and easily detachable path for separating the unit board from the flexible base, preventing errors caused in the process of having to punch through the whole periphery of the unit board.

Regarding Claim 22, Applicant's Admitted Prior Art teaches a bonding pad (Reference number 31) on a top surface of the unit board; a contact (Reference number 33) on a bottom surface of the unit board; and a via hole (Reference number 32) through the unit board electrically connecting the bonding pad to the contact. See Figure 2. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 23, Applicant's Admitted Prior Art fails to explicitly teach that the contact comprises a layer of copper plated with gold. It was well known in the art at the time the invention was made, to use gold to plate a copper contact in printed circuit board technology to improve electrical conductivity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the contact comprising a layer of copper plated with gold, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and based on the excellent conducting properties of copper and gold. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 24, Applicant's Admitted Prior Art teaches a dam (Reference number 35) disposed at the periphery of the unit boards. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 25, Applicant's Admitted Prior Art fails to explicitly teach the base board is made of a glass-epoxy material. It was well known in the art at the time the invention was made, to use a glass-epoxy material for the substrates of printed circuit boards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the base board of a glass-epoxy material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and based on the excellent flexibility properties of a glass-epoxy material. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 26, Applicant's Admitted Prior Art teaches that the base board includes a sprocket hole (Reference number 41) along at least an edge thereof.

Regarding Claim 27, Applicant's Admitted Prior Art teaches that the base board includes a position hole (Reference number 42) along an edge thereof.

Regarding Claim 28, Applicant's Admitted Prior Art teaches a semiconductor chip (Reference number 21) attached to an upper surface of the unit board, the chip having a connection pad (It is inherent that there is a pad used to connect the bonding wire to the chip) on an upper surface thereof; and a conductive wire (Reference number 23) having opposite ends, each bonded to a respective one of the bonding pad on the unit board

and the connection pad on the chip. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 29, Applicant's Admitted Prior Art teaches a protective cover (Reference number 24) formed on the top surface of the unit board. Therefore, it is inherent that all the unit boards have the same arrangement.

7. Claims 30-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Haghiri-Tehrani (US Patent No.5,362,955). As best understood by the examiner:

Regarding Claim 30, Applicant's Admitted Prior Art teaches a reel-deployable printed circuit board (See Figure 6) comprising: an elongated, flexible base board having opposite edges (reference number 40), but fails to explicitly teach: a slit formed into it, the slit having an inner periphery defining a unit board within the flexible base board; and one or more connection bars connecting the unit board to the base board such that the unit board is pivotable on the connection bar relative to the base board, the connection bar(s) being disposed such that an axis of the connection bar(s) is perpendicular to a direction of movement of the reel-deployable printed circuit board.

Furthermore, the limitation: "the unit board is pivotable on the connection bar relative to the base board", is an intended use limitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus

satisfying the claimed structural limitations. See *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Haghiri-Tehrani teaches an elongated, flexible base board (Reference number 11) having a slit formed into it (See Figure 5), the slit having an inner periphery defining a unit board within the flexible base board (See Figure 5); and one or more connection bars (Reference number 30) connecting the unit board to the base board such that the unit board is pivotable on the connection bar relative to the base board (See Figure 5), the connection bar(s) being disposed such that an axis of the connection bar(s) is perpendicular to a direction of movement of the reel-deployable printed circuit board.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Applicant's Admitted Prior Art and Haghiri-Tehrani in order to have a flexible base board having a slit formed into it, the slit having an inner periphery defining a unit board within the flexible base board; and one or more connection bars connecting the unit board to the base board, the connection bar(s) being disposed such that an axis of the connection bar(s) is perpendicular to a direction of movement of the reel-deployable printed circuit board. Thus creating a specific, small and easily detachable path for separating the unit board from the flexible base, preventing errors caused in the process of having to punch through the whole periphery of the unit board.

Regarding Claim 31, Applicant's Admitted Prior Art teaches a bonding pad (Reference number 31) on a top surface of the unit board; a contact (Reference number 33) on a bottom surface of the unit board; and a via hole (Reference number 32) through the unit board electrically connecting the bonding pad to the contact. See Figure 2. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 32, Applicant's Admitted Prior Art fails to explicitly teach that the contact comprises a layer of copper plated with gold. It was well known in the art at the time the invention was made, to use gold to plate a copper contact in printed circuit board technology to improve electrical conductivity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the contact comprising a layer of copper plated with gold, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and based on the excellent conducting properties of copper and gold. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 33, Applicant's Admitted Prior Art teaches a dam (Reference number 35) disposed at the periphery of the unit boards. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 34, Applicant's Admitted Prior Art fails to explicitly teach the base board is made of a glass-epoxy material. It was well known in the art at the time the invention was made, to use a glass-epoxy material for the substrates of printed circuit boards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the base board of a glass-epoxy material, since it

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has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and based on the excellent flexibility properties of a glass-epoxy material. See *In re Leshin*, 125 USPQ 416.

Regarding Claim 35, Applicant's Admitted Prior Art teaches that the base board includes a sprocket hole (Reference number 41) along at least an edge thereof.

Regarding Claim 36, Applicant's Admitted Prior Art teaches that the base board includes a position hole (Reference number 42) along an edge thereof.

Regarding Claim 37, Applicant's Admitted Prior Art teaches a semiconductor chip (Reference number 21) attached to an upper surface of the unit board, the chip having a connection pad (It is inherent that there is a pad used to connect the bonding wire to the chip) on an upper surface thereof; and a conductive wire (Reference number 23) having opposite ends, each bonded to a respective one of the bonding pad on the unit board and the connection pad on the chip. Therefore, it is inherent that all the unit boards have the same arrangement.

Regarding Claim 38, Applicant's Admitted Prior Art teaches a protective cover (Reference number 24) formed on the top surface of the unit board. Therefore, it is inherent that all the unit boards have the same arrangement.

Response to Arguments

8. Applicant's arguments filed 4/11/02 have been fully considered but they are not persuasive.

9. Applicant argues that the third element of a prima facie case of obviousness has not been established, since the limitation: "such that the unit board is pivotable on the connection bar relative to the base board", is not explicitly taught by the Haghiri-Tehrani reference. Examiner respectfully disagrees with applicant, and points out that the limitation: "such that the unit board is pivotable on the connection bar relative to the base board", is just an intended use limitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987). In addition, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

10. Furthermore, applicant argues that the purposes and uses of the present invention and the invention disclosed in the Haghiri-Tehrani reference are completely different. Examiner would like to point out that the fact that applicant has recognized

another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

11. Additionally, applicant argues that the first element of a prima facie case of obviousness has not been established, since there is no suggestion or motivation, to combine reference teachings. Examiner would like to point out that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. See *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated or that the motivation has to be the same than in the invention. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971) references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. See *In re Bozek*, 163 USPQ 545 (CCPA 1969).

In this case, applicant says that the purpose of the three bar areas 30 in the Haghiri-Tehrani reference is to increase punching precision, and that by contrast the invention has the: "at least one connection bar", with the purpose of "decreasing warpage of the unit boards". Examiner would like to point out that, if the structure of the invention is not patentably distinguishing over the structure of the prior art applied, the intended use of the invention does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Furthermore, it was well

known in the art at the time the invention was made to prevent warpage of printed circuit boards, for example see Japanese document: JP 11274348 A, incorporated to record but not relied upon.


Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents disclose some of the elements of the instant claimed invention, and/or show some of the advantages of the instant claimed invention: Hirayama (JP 11274348), Nakamura (JP 05013502), Chung (US 6,288,905) and Nakashima et al. (US 5,661,086).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose H Alcala whose telephone number is (703) 305-9844. The examiner can normally be reached on Monday to Friday.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


ALBERT W. PALADINI
PRIMARY EXAMINER

JHA
October 30, 2002